

Patent Application of  
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for

TITLE: FORK CROWN SUPPORTED BICYCLE CARRIER

CROSS REFERENCE TO RELATED APPLICATIONS Not Applicable

FEDERALLY SPONSORED RESEARCH Not Applicable

SEQUENCE LISTING OR PROGRAM Not Applicable

BACKGROUND OF THE INVENTION--FIELD OF THE INVENTION

**[0001]** The present invention relates to a vehicle mountable bicycle carrier, particularly to a bicycle carrier that retains a bicycle in a vertical position for the convenient loading and unloading of standard and non-standard bicycle frame designs.

BACKGROUND OF THE INVENTION

**[0002]** Bicycles are often transported between locations on carriers which attach to vehicles. In many cases, these carriers incorporate an arm or cradle that the top tube of a bicycle rests on or in, to support the bicycle. However, women's bicycles and many newer non-traditional frames, especially full suspension mountain bikes, do

not have a top tube. As a result, these types of bicycles cannot be directly mounted on many carriers.

**[0003]** Several designs aim to overcome this problem. One such design places the bicycle on top of the vehicle by removing the front wheel and clamping to the exposed ends of the bicycle fork. Problems with this design include the hassle associated with removing the front wheel, and the need to store the wheel elsewhere. Also the bicycle needs to be lifted up high and placed on top of the vehicle. Another design incorporates a surrogate top tube, as described by Hilk in U.S. Pat. No. 6,435,523, Aug. 20, 2002, whereby a tube is attached to the handlebars and seat post of a bicycle and the bicycle and attached tube is then affixed to a bicycle carrier. This design requires the user to attach the device to the bicycle in two different places, and then to attach the device to the bicycle carrier, adding greatly to the amount of time needed to attach the bicycle to the vehicle. Other designs carry a bicycle behind a vehicle via cradles in which the bicycle wheels sit. This style of bicycle carrier is generally large, complicated, and cumbersome, especially for ones which carry a plurality of bicycles. Another common design of hitch mounted bicycle carrier simply stacks the bicycles on a fork or similar structure, requiring the removal of the outermost bicycles to access the innermost bicycles.

## BACKGROUND OF THE INVENTION—OBJECTS AND ADVANTAGES

**[0004]** Several objects and advantages of the present invention include:

- a) to provide a vehicle mountable bicycle carrier capable of carrying any bicycle regardless of its frame design.
- b) to provide a vehicle mountable bicycle carrier which is easy to use.
- c) to provide a vehicle mountable bicycle carrier which carries one or more bicycles without the removal of any part of any bicycle.
- d) to provide a vehicle mountable bicycle carrier which carries a plurality of bicycles and does not require the removal of any bicycle to access another bicycle.

- e) to provide a vehicle mountable bicycle carrier which is not overly complex and cumbersome.

## SUMMARY

**[0005]** The present invention provides a vehicle hitch mountable bicycle carrier consisting of an upper bar containing cradles made up of paired V shaped tines, in which the crown of a bicycle fork fits. The bicycle hangs from its fork crown in a near vertical orientation, hooked by a cradle on the carrier's upper bar. Furthermore the cradles are orientated such that the bicycle's front wheel and handlebars are turned enough to facilitate the close proximity of another bicycle. The rear wheel is affixed to the carrier's lower bar by a hook or other device.

## DRAWINGS--FIGURES

**[0006]** FIG. 1 is a perspective view of a vehicle with the hitch mounted bicycle carrier having a bicycle mounted thereon.

**[0007]** FIG. 2 is a side view of the bicycle carrier mounted to a vehicle hitch.

**[0008]** FIG. 3 is a perspective side view of a fork crown cradle on the carrier's upper bar.

**[0009]** FIG. 4 is a perspective top view of a fork crown cradle, showing the cradle to bicycle fork crown interface.

**[0010]** FIG. 5 is an end view of a fork crown cradle showing the interface of a bicycle fork crown and the cradle.

**[0011]** FIG. 6 is a side view of the bicycle carrier showing how the angled mounting of the bicycle handlebars facilitates the close proximity of the bicycles.

**[0012]** FIG. 7 is a side view of a bicycle rear wheel secured to the rear wheel stabilizer bar by a J-hook and knob device.

#### DRAWINGS—Reference Numerals

10 bicycle carrier	24 vehicle hitch structure
11 vehicle	25 stabilizer offset tube
12 tines	26 bicycle
13 fork crown cradle	27 bicycle rear wheel
14 horizontal upper bar	28 bicycle fork tubes
18 vertical support mast	30 bicycle fork crown
19 hitch attachment bar	32 bicycle head tube
20 rear wheel horizontal stabilizer bar	34 handlebars
22 J-hook and knob	

#### DETAILED DESCRIPTION--PREFERRED EMBODIMENT

**[0013]** Referring to FIG. 1, the bicycle carrier described herein is shown mounted proximate to the rear of a vehicle **11** for the convenient transport of at least one bicycle **26**. In a preferred embodiment the bicycle carrier is attached to the vehicle **11** through a hitch structure **24** substantially mounted to the vehicle **11**. The bicycles **26** are removably secured within the bicycle carrier for transport by the vehicle **11** and subsequent removal and use at the destination.

**[0014]** FIG. 2 shows the bicycle carrier 10 attached to a vehicle hitch structure 24. The described embodiment of the bicycle carrier 10 has a horizontal upper bar 14 with a plurality of cradles called fork crown cradles 13, attached to a horizontal upper bar 14. A fork crown cradle 13, FIG. 3, is comprised of 4 tines 12 approximately 5 inches in length, arranged into 2 V-shaped structures, with a V angle of approximately 70 degrees, spaced approximately 4 inches apart, and with about the top 1/2 of the tines 12 being parallel. The fork crown cradles 13 can be set at an angle between 0 and 90 degrees from the longitudinal axis of the horizontal upper bar 14. In the described embodiment in FIG. 1 and FIG. 2 the fork crown cradles 13 are at an angle of approximately 45 degrees from the longitudinal axis of the horizontal upper bar 14. Each fork crown cradle 13 is spaced at a distance from an adjacent fork crown cradle 13 to allow the closest possible proximity of another bicycle, about 7 inched in the described embodiment. The horizontal upper bar 14, best shown by FIG.2, is attached to the vertical support mast 18, and the lowermost end of the vertical support mast 18 is affixed to the bicycle carrier hitch attachment bar 19. The bicycle carrier hitch attachment bar 19 is simply slid into a receiver style vehicle hitch structure 24. At a point on the vertical support mast 18 located approximately one bicycle wheelbase length down from the horizontal upper bar 14, is the rear wheel horizontal stabilizer bar 20. In the described embodiment the rear wheel horizontal stabilizer bar 20 is offset to the right by approximately 1/2 of a bicycle wheel diameter, as viewed from behind, by the stabilizer offset tube 25. Spaced equidistant on the rear wheel stabilizer bar 20 and centered with respect to the fork crown cradles 13 on the horizontal upper bar 14, are J-hook and knob devices 22. The J-hook and knob devices 22 are simply hooks with threads and a knob on the non-hooked end, which pass through holes in the rear wheel stabilizer bar 20, and are used to secure a bicycle rear wheel, see FIG. 7.

**[0015]** FIG. 3, FIG. 4 and FIG. 5 are close in views of a fork crown cradle 13 comprised of one pair of V shaped paired tines 12. FIG. 4 is an overhead view looking down on one fork crown cradle 13, showing the bicycle fork crown 30 and the bicycle head tube 32, contained within the fork crown cradle 13 and showing the bicycle fork

tubes **28** running outboard of the tines **12**, and the bicycle head tube **32** running inboard of the tines **12**. As viewed in **FIG. 5**, the bicycle fork crown **30** is placed between the 2 leftmost and 2 rightmost tines **12**.

**[0016]** As shown in **FIG. 6** the close mounting of adjacent bicycles **26** is facilitated by the fork crown cradles **13** being set at an angle of approximately 45 degrees from the horizontal upper bar **14**. This angle inherently turns the bicycle fork and most importantly the handlebars **34** to approximately the same angle, thereby eliminating interference with another bicycle's handlebars, mounted to an adjacent fork crown cradle **13**.

**[0017]** **FIG. 7** shows how the rear wheel of the bicycle **27** is secured against the rear wheel stabilizer bar **20** by a J-hook and knob device **22**. This device consists of a hooked metal rod mounted through a hole in the rear wheel stabilizer bar **20**. The straight end is threaded with a knob attached. The rear wheel of the bicycle is simply hooked by the J-hook and tightened against the rear wheel stabilizer bar **20** by the knob.

## Conclusion

**[0018]** The reader will see that the bicycle carrier of this invention can be used to transport, by vehicle, any bicycle with a front fork, encompassing virtually all known bicycle designs. The carrier design allows the quick and convenient loading and unloading of bicycles, without the need to remove any bicycle to access another. Furthermore the design provides an efficient way to carry as many bicycles as possible, in as little space as possible, by turning the handlebars, thereby preventing interference.